Land use

4.7.3.3 · Ecology · revision notes

Humans use land for building, quarrying, farming and dumping waste, leaving less for other species. You also need the example of peat bogs: why destroying them reduces biodiversity and releases carbon dioxide.

Key facts

- Land is used for building, quarrying, farming and dumping waste
- Peat = partly decayed plant material that forms very slowly in waterlogged bogs
- Destroying peat bogs → less habitat → lower biodiversity
- Peat-free compost helps protect peat bogs
- Less land for other species → lower biodiversity
- Peat is dug up to produce garden compost
- Burning or decay of peat → releases CO_2

Notes

How humans use land

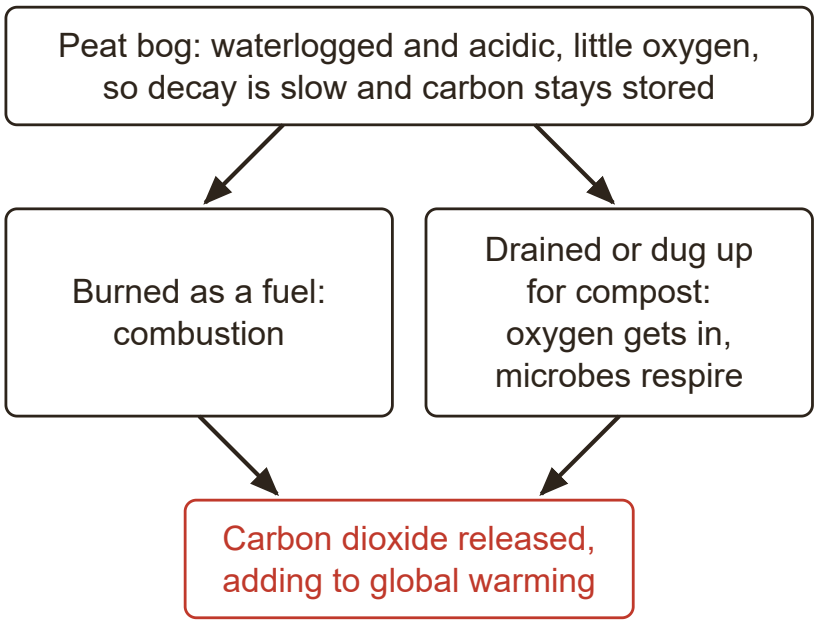
- **Building**, **quarrying**, **farming** and **dumping waste** all take up land, leaving less for other plants and animals.
- As the human population grows, more land is needed for houses, roads, factories and food.
- Destroying habitats leaves less space, food and shelter for other species, so biodiversity falls.
- Farming large areas of one crop replaces many species with just one.

Peat bogs

- **Peat** is made of partly decayed plant material. It forms in bogs, which are waterlogged and acidic, so there is little oxygen and decay is very slow.
- Peat builds up extremely slowly, so it is used up far faster than it forms.
- Peat bogs are the habitat of a particular range of plants, animals and microorganisms, many of them rare.
- Digging peat out of bogs to sell as garden compost shrinks this habitat, so fewer of its plant, animal and microorganism species can survive: biodiversity falls.

Peat and carbon dioxide

- Peat is a store of carbon, locked up in plant material that has not decayed.
- When peat is **burned** as a fuel, combustion releases carbon dioxide.
- When peat is drained or dug up and spread as compost, oxygen reaches it, so microorganisms decay it and their respiration releases carbon dioxide.
- This adds to the carbon dioxide in the atmosphere, which contributes to global warming.



Two ways that using peat releases the carbon stored in it.

- Using **peat-free compost** (e.g. made from garden waste, bark or coconut fibre) helps protect peat bogs.
- The **conflict**: cheap peat compost helps produce more food, but conserving peat bogs protects biodiversity and cuts carbon dioxide emissions.

How to answer each type of question

Recall: how humans reduce land for other species 2 marks Grade 3

1. Give two from: building, quarrying, farming, dumping waste (landfill).
2. Be specific: 'building houses' rather than 'using land'.

Example. Give **two** human activities that leave less land for wild plants and animals.

Model answer. Any two from: building (1); quarrying (1); farming (1); dumping waste / landfill (1)

Explain why destroying peat bogs is harmful

3 to 4 marks | Grade 5

1. Biodiversity: the habitat is lost, so fewer species survive there.
2. Carbon: peat stores carbon, and burning or decay releases it as carbon dioxide.
3. Link carbon dioxide to global warming.
4. Peat forms very slowly, so it cannot be replaced quickly.

Example. Many gardeners use peat as compost. Explain why conservation groups want gardeners to stop using peat compost. (4 marks)

Model answer. Digging up peat destroys peat bog habitats (1), so the variety of species there / biodiversity falls (1). When peat is used as compost it decays, and the microorganisms release carbon dioxide by respiration (1). Carbon dioxide contributes to global warming (1). Also credit: peat forms very slowly, so it is not replaced.

Explain how peat releases carbon dioxide

2 to 3 marks | Grade 5

1. Say that peat contains carbon from plants that did not fully decay.
2. Burning: combustion releases carbon dioxide.
3. Draining: oxygen reaches the peat, microorganisms decay it, and their respiration releases carbon dioxide.

Example. A peat bog is drained so that the land can be farmed.
Explain why the land then releases more carbon dioxide. (3 marks)

Model answer. Draining lets air / oxygen into the peat (1). Microorganisms can now decay the peat faster (1). They respire, releasing the carbon stored in the peat as carbon dioxide (1).

Evaluate a land use decision

4 to 6 marks | Grade 7

1. Give advantages for people (homes, jobs, food, materials).
2. Give disadvantages for other species (habitat loss, lower biodiversity) and for the environment.
3. Suggest how the harm could be reduced.
4. Give a judgement with a reason.

Example. A company wants to open a quarry on a hillside of grassland where a rare butterfly lives. Evaluate this plan. (4 marks)

Model answer. The quarry would provide stone for building and jobs for local people (1). The grassland habitat would be destroyed, so the rare butterfly could disappear from the area and biodiversity would fall (1). Lorries and machinery could cause pollution (1). Judgement with a reason, e.g. the plan should only go ahead if part of the grassland is protected or the site is restored afterwards (1).

Don’t lose marks

- Giving only one of the two problems with using peat. Most questions want both: loss of habitat (biodiversity) and release of carbon dioxide.
- Saying peat releases carbon dioxide 'naturally' without the process: combustion, or respiration by microorganisms.
- Saying land use 'kills animals' without explaining habitat loss: less food, space and shelter.
- Writing that peat 'contains carbon dioxide' or 'releases carbon'. Peat stores carbon compounds; burning or decay releases carbon dioxide.

More tips

Memory tricks

- Land use, BQFW: Building, Quarrying, Farming, Waste.
- Peat is a carbon bank: burn it or let it decay and the carbon comes back out as carbon dioxide.
- Waterlogged means little oxygen, so decay is slow and peat builds up.

Exam technique

- For peat questions, cover both biodiversity and carbon dioxide unless told otherwise.
- In 'evaluate' questions, give points on both sides and a justified conclusion.
- Use the terms habitat, biodiversity, respiration and combustion.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 3 — **Name ways humans use land**
Building, quarrying, farming and dumping waste.

Grade 4 — **Explain how land use reduces biodiversity**
Habitats are destroyed, so there is less space, food and shelter for other plants and animals.

Grade 5 — **State why peat bogs are destroyed**
Peat is dug up to produce garden compost.

Grade 5 — **Explain how destroying peat bogs affects biodiversity**
Less bog habitat means fewer of the plants, animals and microorganisms that live there can survive, so biodiversity falls.

Grade 5 — **Explain how using peat releases carbon dioxide**
Burning peat, or its decay by microorganisms once it is exposed to oxygen, releases carbon dioxide.

Grade 7 — **Evaluate a decision about land use**
Weigh people's needs for homes, jobs and materials against the loss of habitats and biodiversity.

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